File I
Memos In [redacted]

7 December 1961

25X1A

MEMORANDUM FOR: Major Charles [redacted] DPD/DDP

THROUGH: Chief, Technical Plans & Development Staff, NPIC
MWK 7 Dec 61

SUBJECT: Service Test, HTA-3 Film Processor and Drier

1. During the period 6 - 10 November 1961, the undersigned directed the service field testing of the HTA-3 Continuous Film Processor and Drier manufactured by the Houston-Fearless Corporation at their plant in Los Angeles, California, under Contract # (RD)XG-2188.

2. For the final testing phases, personnel of March AFB, California, supplied approximately 1000 feet of S.O. 1188 negative film exposed in an A-2 camera at altitude. The subject film was processed in D-19 developer (full strength) at 80° F. at 30 FPM, at 75° F. at 13 FPM, and at 68° F. at 6 FPM.

3. In each instance the drier functioned efficiently at ambient conditions of 75° F., 50% RH. It was both curious and interesting to note that there was very little significant difference in the physical and photographic quality of the film processed at higher temperature and high speed with that processed at 68° F. at 6 FPM.

4. In addition to the S.O. 1188 negative film, several hundred feet of Class "L" Triacetate plus X Aerocon was processed and dried at 30 FPM. Also, several hundred feet of S.O. 278 was processed and dried at 30 FPM. These latter films were given a flash exposure to test the evenness of developing across the full 9½" width of film. Samples of these films have been tested with the Microdensitometer and a trace transverse to the direction of flight reveals no significant density changes.

5. It might be interesting to note that the HTA-3 was a logical outgrowth of the HTA-1 and -2 series. The basic changes are: an increase in width of all rollers to 15 inches and a complete redesign of the drier section. The HTA-3 series breaks down into five sectional components as follows: (1) a main drive and magazine section containing the power supply; (2 & 3) two wet sections; (4) the drier and accumulator section; and (5) a take up assembly. Each of the above sections has its own base with appropriate leveling screws. These sections can be assembled and aligned and made ready for operation within five hours. Provisions are for replenishment of the developer and fixing sections and a manifold for overflow and wash water to a flexible drain coupling. Wash water is provided through a mixing valve requiring hydrant water and hot or cold water as local conditions dictate. The first wet section is comprised of three compartments: a pre-wet or rinse section;

a development section; and a shortstop section.

6. The first tank of pre-wet can be utilized in conjunction with the second section to provide a two-solution developer or to increase the developing time in a single solution system. The shortstop tank can be used as a static acid bath or a running water rinse. The second wet section is comprised of the fixing bath and three wash compartments, the first of which is all spray and the last two, a combination spray and immersion. Agitation in the developer and fixing baths is accomplished by turbulators and a flow-rater is provided for these two solutions for replenishment during continuous operation.

7. The drier is the warm air impingement type. The rollers in the drier are stainless steel, 4 inches in diameter, coated with Teflon. Electrical heaters are provided to maintain temperatures as high as 170° F. over sustained periods. The warm air is impinged upon the film by six plenums. The amount of fresh make-up air is controlled by a gate-type valve and the intake air is passed through filters. The plenums are also Teflon covered. During one phase of the testing, the film was stopped in the drier for ten minutes to simulate a breakdown. When the processor was again turned on, the film moved through the drier without hesitation. The points of contact of the film and the rollers in the drier cabinet were visible but the image was not rendered useless.

8. During this rather extensive testing period the HTA-3 proved to be remarkably trouble-free and reliable. In spite of the fact that these tests were conducted in an area normally used as a machine shop rather than a photographic laboratory, there were no physical defects such as scratches noted on the film which could have occurred either in the processor or drier sections. The film pass of five feet from the top of the accumulator to the take up assembly allows for proper centering of the film on the reel and complete elimination of edge frilling. Two separate torque motors are provided, one of which is located just prior to the accumulator section and the other at the take-up assembly. Since these torque motors operate independently, no loss of tension or tracking is incurred when removing a full spool of film from the take-up assembly.

9. The HTA-3 was primarily designed to process and dry the new thin base materials. The S.O. 1188 negative material is regarded as one of the most difficult of these thin base materials to process and dry. All of the rollers in the processor and drier are uncrowned and since the length of these rollers is 15 inches, all film widths up to and including 9½ inches can be safely processed. It is the opinion of the undersigned that the HTA-3 will be an unqualified success in photographic installations requiring high speed and high quality film processing.

25X1A

10. Four HTA-4 machines have recently been installed at Westover AFB. A full report on these machines can be obtained from Col. [redacted] The HTA-4 is a convertible spray and immersion processor with a tendency drive which replaces the clutches on the drive rollers. This processor is

built on a single heavy cast stainless steel base and is not intended to be portable in any sense of the word. A logical development as a successor to the HTA-3 and -4 machines would be the HTA-5 which would incorporate the best features of the HTA-3s and -4s with the introduction of liquid and air bearings to replace all moving rollers. Such a processor could easily be expanded in width to accommodate 18" wide film. With the use of the liquid 25X1A
bearings in the wet sections of the processor and the air bearings in the drier, virtually all tracking and tensioning problems would be completely eliminated. These bearings are a recent invention of [redacted] 25X1C
now in the employ of Houston-Fearless and formerly of [redacted]
25X1C A demonstration of these bearings was witnessed by the undersigned at WADC in October 1961. Less than two ounces of weight was required to move a 9½" width across these bearings. A demonstration of this device will be made in the Washington, D. C. area late this month by the local Houston-Fearless representative.

25X1A

[redacted]